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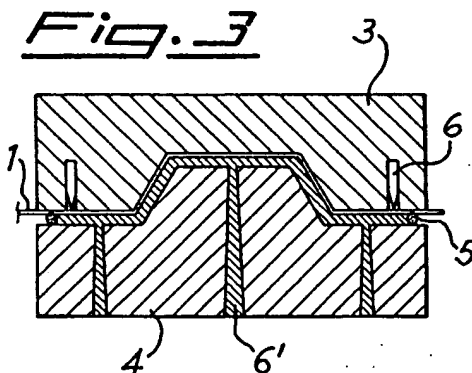
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(54) **Method for the production of coated panels.**

(57) A method for the production of coated panels foresees to position a coating of formable material into a mold and to inject under pressure a second thermoplastic material into said mold, on the coating back, shaping said coating and being coupled therewith to give the finished panel.



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The present invention concerns a method for the production of coated panels.

In particular the invention concerns a method for the production of internal panels for motor vehicles, of the type used as coating panels, covering or supporting panels, battery covers and the like.

Several techniques are known for producing coated panels by coupling a supporting layer with a coating, generally consisting of a PVC sheet shaped as "imitation leather" and possibly provided with fabric inserts.

A first technique envisages to shape and simultaneously couple, by molding, the coating with a thermoplastic sheet-like support previously rendered able to be shaped by heating. Examples of this technique are described in the European patent applications n. 90110188.1 and n. 90110187.3, both filed by COMMER S.p.A.

An alternative technique proposes to shape a support made of thermosetting material and to couple the support thus obtained with the desired coating by sticking.

According to a further known technique, the support, consisting of rigid polyurethane, is injected as foam into a mold in which a previously thermofomed coating is positioned. In way the molding and coupling of the support are simultaneously obtained.

A disadvantage shared by these techniques consists in the fact that a preshaping of the support or the coating is necessary. In case of the first mentioned technique as well, the coating must be preshaped to obtain the desired "imitation leather" appearance; moreover, during shaping by molding, the material is drawn in a non uniform way, thus imitation leather loses part of the peculiar roughness of the surface with subsequent loss of the required aesthetic effect.

A further disadvantage of the known techniques is given by the need of separately forming the staples necessary for some kinds of panels, and of fixing said staples to the panel, generally by sticking them thereto, after the panel molding.

The negative economical impact of such known manufacturing techniques is obvious.

An object of the present invention is therefore that of proposing a method for the production of coated panels for motor vehicles which associates the steps of shaping and coupling, and allows to obtain a finished panel in a single operation.

This object is achieved by means of the present invention, which concerns a method for the production of coated panels, of the type comprising the simultaneous coupling and molding of the support of said panel with the relevant coating, characterized by the steps of positioning a coating of formable material inside a mold and injecting a second thermoplastic material, in plastic conditions

and under pressure, into said mold, simultaneously shaping said first and said second material.

According to a preferential aspect of the invention, the coating material is not only shaped as tridimensional form, but also in correspondence with its own external surface so as to obtain an "imitation leather" effect during the injection molding of the support.

According to a further aspect of the invention, the panel is trimmed by shearing before it is removed from the mold. The invention will be now described with reference to the accompanying drawings given with illustrative and not limiting purposes, where:

- figures 1-5 schematically show the different steps of the method according to the invention.

It is here pointed out that the word "panel" is meant to feature any type of a more or less shaped element, consisting of a coated self-bearing support. A preferential kind of panel according to the invention, which is referred to in the present invention with no intention of limiting it thereto, is the one used for motor vehicles interiors, and comprises side panels, dashboards, supporting panels, battery covers and the like. As previously mentioned, the method according to the invention envisages to position a coating made of a formable material inside the mold and to inject a second thermoplastic material, in plastic conditions and under pressure, into said mold, simultaneously shaping said first and said second material and coupling them with one another.

Any type of material capable to be deformed by the injection pressure of the supporting material can be used as said formable coating material. Examples of suitable coating materials are the coatings used in the production of internal panels for cars, such as those made of velvet-like fabric, felt-like stuff or non-fabric fabric, possibly coupled with a layer of foamed material, preferably PVC foam. It is also possible to use coating materials such as PVC films "imitation leather" type or with smooth surface, preferably coupled with fine jersey to improve seal with the support: polypropylene films and other films of other plastic materials which can be shaped under molding conditions.

Any thermoplastic material susceptible of injection molding such as for instance PVC (polyvinylchloride) and vinyl resins in general can be used as supporting material: polyethylene, polypropylene and polyolefins in general: polyacrylate and polymethacrylate resins as well as polystyrene resins.

Preferably the aforelisted resins are loaded, in a way known to the technique, with one or more inerts. A preferred supporting material is constituted by polypropylene loaded with wood dust and

commercialized under the name of "Woodstock" (Registered Trademark).

According to a particularly advantageous configuration of the invention, the supporting material is "Woodstock" and the coating consists at least partly of a polypropylene film possibly provided with fabric inserts.

With reference first of all to figure 1, the method according to the invention foresees to place a coating 1, to be fed step by step as a continuous ribbon from a roll 2, in between the two halves 3 and 4 of a mold for injection molding, provided with blankholders 5 ensuring sealing when the mold is closed (fig. 2) though allowing the coating enrichment necessary as a function of the shaping to be obtained.

The thermoplastic supporting material 6 is then injected (fig. 3). Said injection is obviously performed on the coating 1 back, in a way known to the skilled in the art, namely rendering the supporting material plastic and injecting it under pressure.

During this stage the supporting material 6 injected under pressure forces the coating 1 against the half-mold 3 to adhere thereto and shapes it according to the configuration of the half-mold 3.

According to a particularly advantageous feature of the invention, a formable coating material is used consisting in sheets or ribbons of smooth thermoplastic material, the outer surface of which, namely the one visible on the finished panel, is shaped during the molding stage according to the invention, so as to obtain a coating with aesthetic effect type "imitation leather" simultaneously with the panel production.

When the panel is formed, it is trimmed (fig. 4) by shearing thanks to movable blades 6 housed in one or both half-molds.

At this point the finished panel 7 is removed (fig. 5). All necessary manufacturing steps have thus been performed in a single operation: in fact the method according to the invention allows to obtain directly in the mold 3, 4 also the forming of staples or slots (not shown) with obvious advantages for the manufacturing time schedule.

The invention will be now furtherly illustrated by means of the following example.

#### EXAMPLE

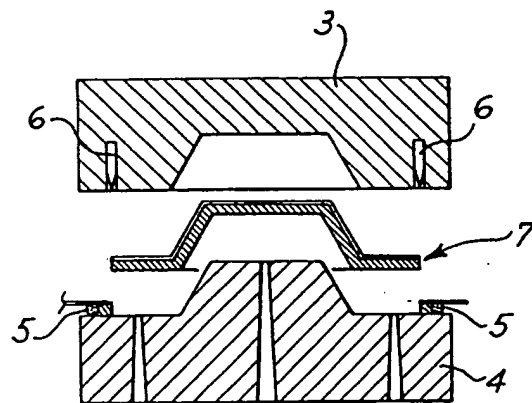
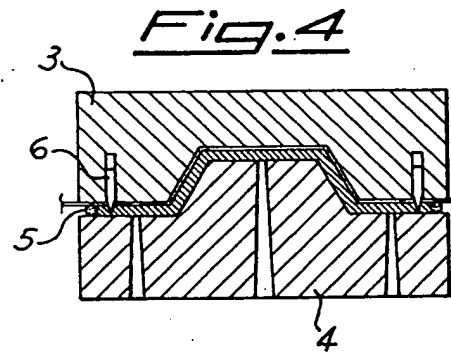
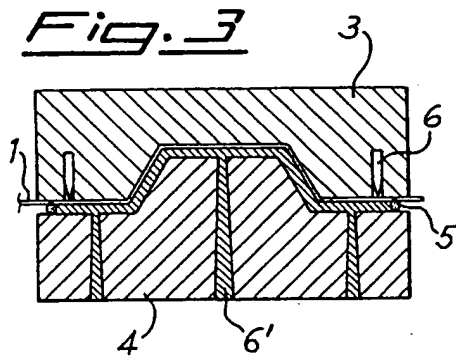
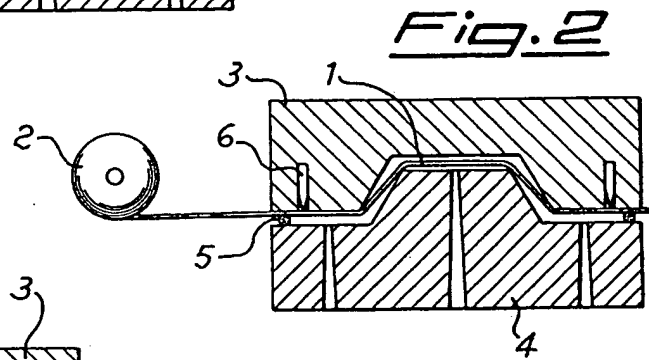
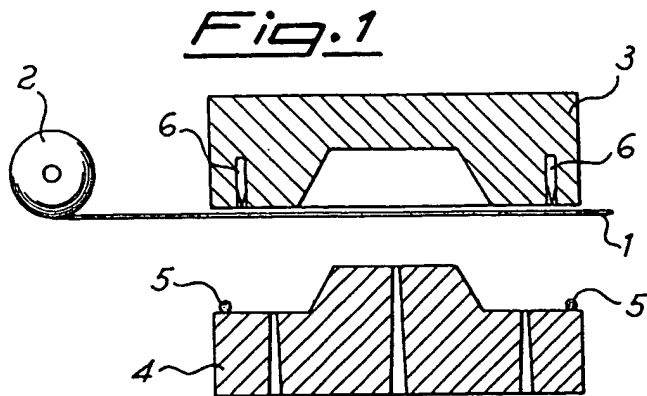
A portion of traditional velvet fabric is positioned into a pilot mold. Then a support of loaded (woodstock) polypropylene is injected at a temperature of approximately 200 degrees C. A perfect shaping of the fabric layer is obtained together with its excellent adhesion to the relevant support.

The preceding example was repeated several times replacing the portion of velvet fabric with a

coating selected in sequence among the following ones: weft-warp fabric, jersey velvet, ladderproof fabric, felt-like non-fabric stuff, not felt-like non-fabric stuff and PVC with or without support.

#### Claims

1. A method for the production of coated panels, of the type comprising the simultaneous coupling and molding of the support of said panel with the relevant coating, characterized by the steps of positioning a coating made of formable material inside a mold, and injecting a second thermoplastic material, in plastic conditions and under pressure, into said mold, simultaneously shaping said first and said second material.
2. A method according to claim 1, characterized in that said coating material, under the form of continuous ribbon, is fed step by step to the molding means.
3. A method according to claim 1 or 2, characterized by the fact of using a coating material with flat surface and by the fact of shaping said surface, during said molding operation, by means of the surface of said mold to obtain an "imitation leather" type effect.
4. A method according to claim 1 or 2, characterized by the fact of controlling by means of blankholders the sealing and enrichment of said coating material.
5. A method according to claim 1, characterized in that said supporting thermoplastic material is polypropylene loaded with wood dust.
6. A method according to claim 1 or claim 5, characterized in that said formable coating material is constituted at least partly by a polypropylene film.
7. A method according to claim 1, characterized in that it also comprises a step in which the formed panel is trimmed before its removal from the mold.
8. A coated panel as can be obtained by a method according to one of the claims 1 to 7.





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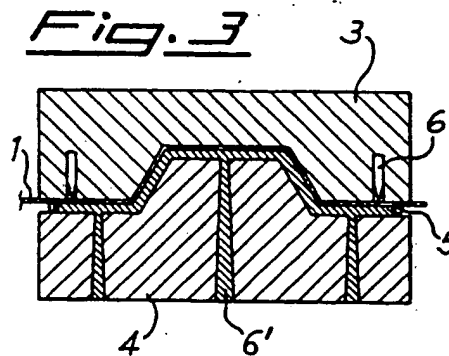
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# EUROPEAN SEARCH REPORT

Application Number

EP 92 10 1529

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	EP-A-0 320 925 (BAYERISCHE MOTOREN WERKE) * claim 1; figure 1 *	1-8	B29C45/14
X	--- PATENT ABSTRACTS OF JAPAN vol. 4, no. 45 (M-6)(527) & JP-A-55 015 888 ( RIYUUJI UEMATSU ) 4 February 1988 * abstract *	1-8	
A	--- PATENT ABSTRACTS OF JAPAN vol. 4, no. 25 (M-1)(507) 5 March 1980 & JP-A-55 000 213 ( YUTAKA NAKAMURA ) 5 January 1980 * abstract *	5	
A	--- EP-A-0 329 792 (NISSHA PRINTING CO LTD) * claim 1; figure 1 *	1-8	
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			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B29C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26 OCTOBER 1992	Searcher KIRSTEN K.R.M.
<b>CATEGORY OF CITED DOCUMENTS</b> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document			

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